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# Quality Role in Exploration Development

**CQSDI Cape Canaveral March 2008**

**Bryan O'Connor  
Chief,  
Safety and Mission Assurance**



Mission Success Starts With Safety

## Safety Quote of the Day

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*Life moves pretty fast, if you don't stop and look around once in a while, you might miss it.*

Ferris Bueller

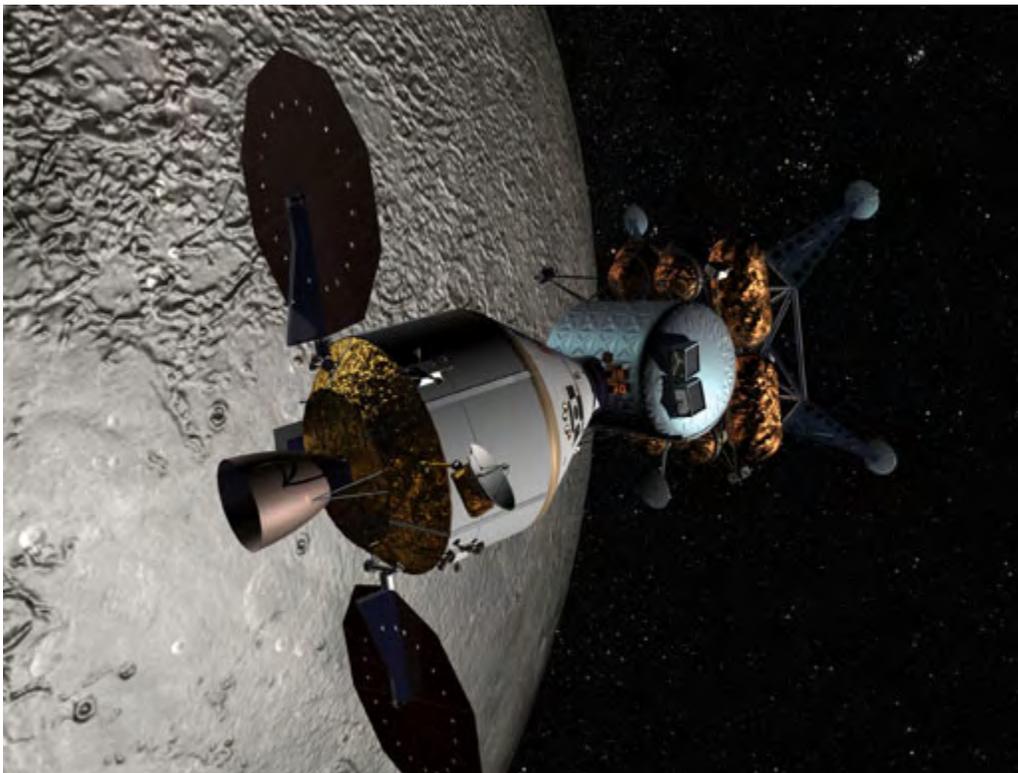
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## The Vision for Space Exploration

The Vision for Space Exploration calls for humans to return to the moon by the end of the next decade, paving the way for eventual journeys to Mars and beyond.



After completing the International Space Station and retiring the shuttle fleet by 2010, the Vision calls for human and robotic explorers to work together on new journeys to worlds beyond.

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## SMA Roles in Exploration Development

- Quality organizations provide ongoing insight, advice and assessments throughout the mission life cycle to assure *good requirements and compliance with same*
- Quality organizations support requirements definition, preliminary design, design trades, manufacturing trades, tool development and other *systems engineering activities*.
- Quality organizations support the *Constellation Program* to design and develop the Crew Exploration Vehicle, Crew Launch Vehicle, Mission Ops and Ground Systems and Concept Definition for future Cargo Vehicles.
- Future *life cycle support* will include manufacturing and flight processing, milestone reviews, certificate of flight readiness, launch countdown, and ops support.



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## **Current Issues with Constellation Implications**

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**Counterfeit parts**

**Lead Free and Tin Whiskers**

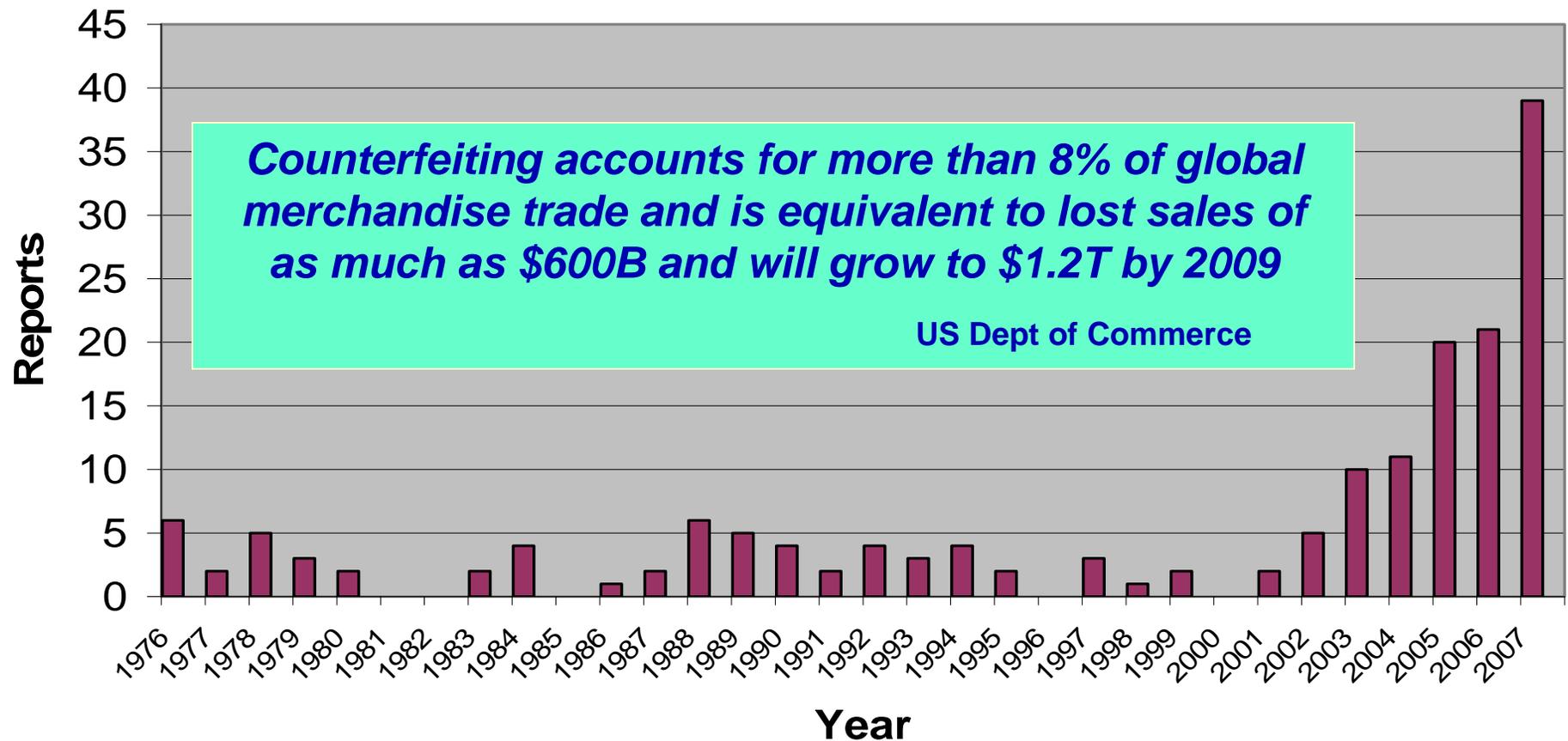
**Standards Transition to VCS**

**Workforce of the Future**

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# Counterfeiting

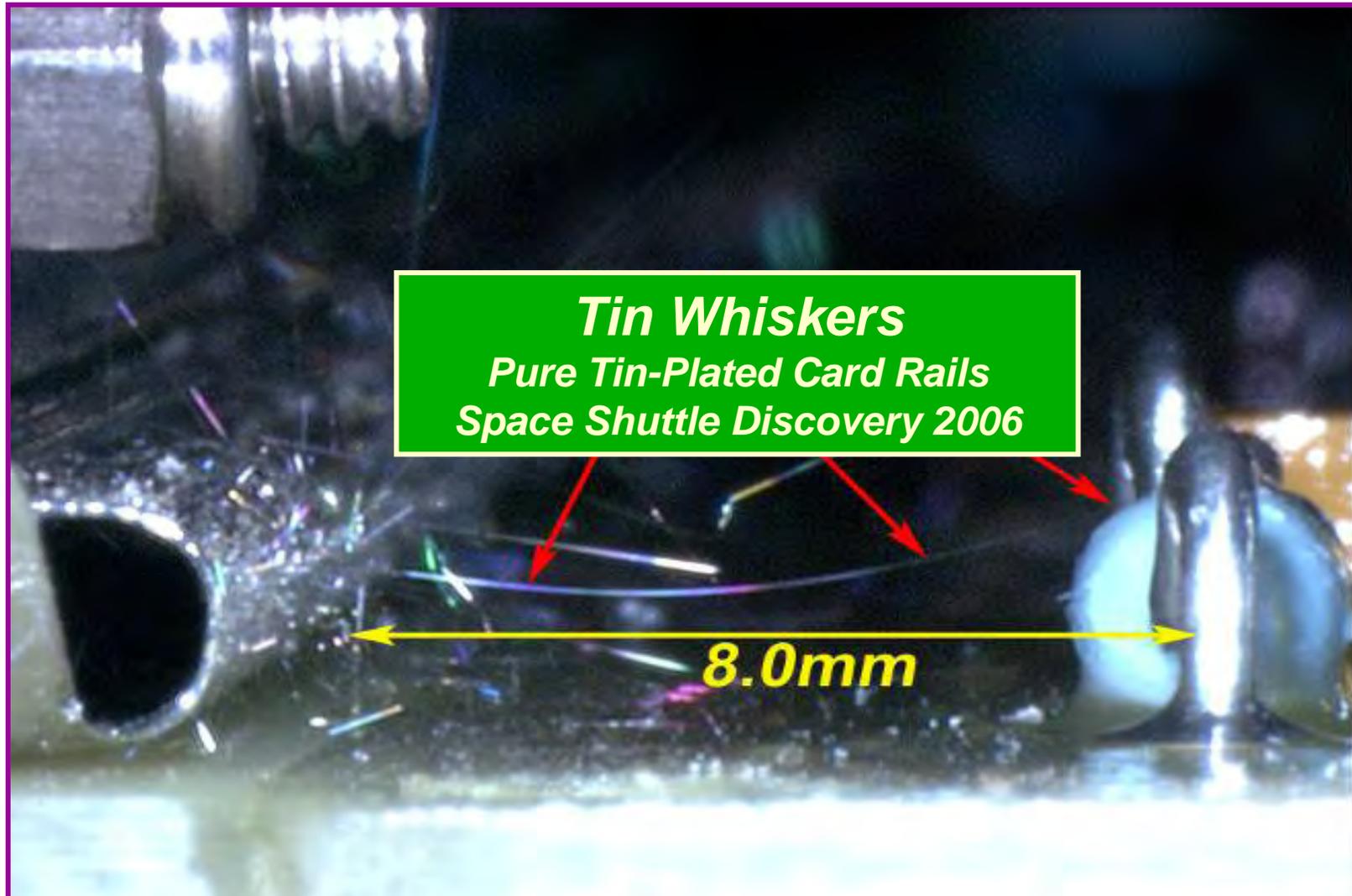


**GIDEP Alerts / Problem Advisories Reporting  
Counterfeit Electronic Components (as of July 2007)**

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# Tin Whiskers





# Transitioning to VCS

## J-STD-001 Space Addendum (Soldering):

NASA Proposal in Industry Coordination.

CxP Workmanship Requirements adapted to carry requirements in parallel (doc in coordination).

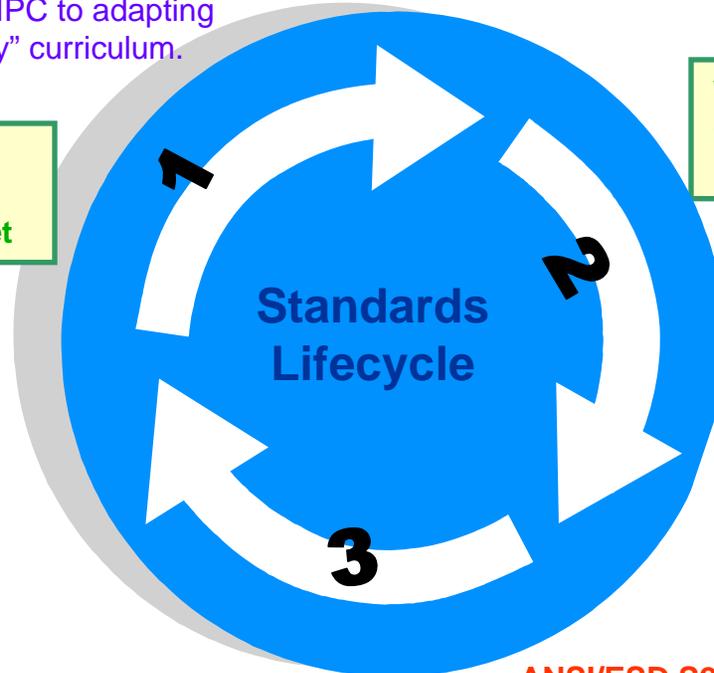
NASA acquires allowance from IPC to adapting training program for "Space Only" curriculum.

Ensure Cohesive Implement-able Requirements Set

## IPC-A-620 Space Addendum (Harness Mfrg):

Preparing "shall" list in preparation for gap analysis of forthcoming draft.

Support IPC meeting in March



Widespread & Consistent Usage

ANSI/ESD S20.20 (Electrostatic discharge): Implementation Plan for Cross-Agency Use (75% complete)

Document Stewardship

ANSI/ESD S20.20: Currently examining requirements for tools and gloves.

# People



Astronauts Pier Sellers  
performing thermal  
inspection on RCC test  
samples during STS  
121



S121E06583



## Characteristics of a Good Quality Engineer

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- Technically credible
- Courageous and full of integrity
- Solid knowledge of technical requirements and tools
- Above average communication skills (verbal & written)
- Experienced in design, manufacturing, T&E and sustaining operations
- Humble yet not reserved
- Persistent yet pragmatic
- Energetic and creative (“yes if”)
- *Skeptical but not cynical*
- Thick skinned with a sense of humor (for longevity)



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## Skepticism as a Cultural Habit

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*There is no harm in doubt and skepticism, for it is through these that new discoveries are made*

Richard Feynman

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## Cynicism vs. Skepticism

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*The skeptic doesn't trust the analysis...  
the cynic doesn't trust the analyst*

Today's Briefer

*A cynic is not merely one who reads bitter lessons  
from the past, he is one who is prematurely  
disappointed in the future*

Sidney J. Harris



## What We Don't Need on Our Team

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### Optimistic Optimists

Humans make mistakes...who's going to catch them?

Nor,

### Pessimistic Pessimists

Otherwise known as cynics...open comm. is too important!



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## What We Need on Our Quality Team

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**Optimistic Pessimists  
or maybe  
Pessimistic Optimists  
who are  
Fearless Communicators**

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# GITTERDUNN...



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